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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/918,365	07/30/2001	Eugene T. Michal	ACS 55933	1073

7590 06/05/2007

Cameron Kerrigan
SQUIRE, SANDERS & DEMPSEY L.L.P
One Maritime Plaza
Suite 300
San Francisco, CA 94111-3492

EXAMINER	
CAMERON, ERMA C	

ART UNIT	PAPER NUMBER
1762	

MAIL DATE	DELIVERY MODE
06/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/918,365	MICHAL ET AL.	
	Examiner	Art Unit	
	/Erma Cameron/	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 6-46* is/are pending in the application.

4a) Of the above claim(s) *19-33 and 35-46* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 6-18, 34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. The rejection of Claims 1-18 and 34 under 35 U.S.C. 112, first paragraph ("how immobilized"), as failing to comply with the enablement requirement, is withdrawn because of the amendment filed 3/2/2007.

3. The rejection of Claims 1-18 and 34 under 35 U.S.C. 112, first paragraph ("polyurethane"), as failing to comply with the enablement requirement is withdrawn because of the amendment filed 3/2/2007.

4. The rejection of Claims 1-18 and 34 under 35 U.S.C. 112, first paragraph ("intermediate"), as failing to comply with the enablement requirement is withdrawn because of the amendment filed 3/2/2007.

5. The rejection of Claims 1-18 and 34 under 35 U.S.C. 112, first paragraph ("peglated"), as failing to comply with the enablement requirement is withdrawn because of the amendment filed 3/2/2007.

6. The rejection of Claim 14 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement is withdrawn because of the amendment filed 3/2/2007.

7. The rejection of Claims 1-8, 10-18 and 34 under 35 U.S.C. 112, first paragraph ("polymerization"), is withdrawn because of the amendment filed 3/2/2007.

8 The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. The rejection of Claims 1-18 and 34 under 35 U.S.C. 112, second paragraph, is withdrawn because of the amendment filed 3/2/2007.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-3, 6-13, 15-17 and 34 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by WO99/38546.

'546 teaches applying to a stent or other device a composition comprising a binding component of isocyanate, aziridine, aldehyde such as cinnamaldehyde or several other species, a grafting component of acrylate groups (such as urethane acrylate), a photoinitiator and a ketone solvent and polymerizing the composition with UV light. A top composition of heparin is applied to the base layer (see Claims and page 4-19; Example 1). The heparin binds to the binding component, thus immobilizing it (see claim 1). The amine groups on the heparin inherently bind to the base layer to effect end immobilization.

Response to Arguments

The applicant has argued that '546 does not teach a specific agent in the top coat. The examiner disagrees. 5:24 describes heparin in the top coat.

12. The rejection of Claims 1, 3, 4, 7, 10-11, 13, 15-17, and 34 under 35 U.S.C. 102(e) as being anticipated by Wang et al. (6,358,557) is withdrawn because of the amendment filed 3/2/2007.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. The rejection of Claims 2, 8-9, 12, 14, and 18 under 35 U.S.C. 103(a) as being unpatentable over Wang et al is withdrawn because of the amendment filed 3/2/2007.

16. Claims 1-3, 6-18 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Fan et al. (5,620,738).

Wang et al. teaches a method for immobilizing anti-thrombogenic agents in a coating on an implantable medical device (col. 1, lines 10-14; col. 11, line 23) by applying a base coat mixture directly to the device (col. 6, lines 10-14), polymerizing the base coat mixture, and immobilizing the anti-thrombogenic agent via functional groups of the polymerized base coat (col. 11, lines 28-35).

The dip-coating method of Wang will inherently coat the outside surface of the medical device.

Wang's base coat mixture contains a grafting material, i.e., the monomers to be polymerized; additional monomers, polymers, and crosslinkers, which would act as the binding materials of Applicant (col. 8, lines 30-40 and throughout); a photoinitiator (col. 8, line 61); and a solvent (col. 8, line 28 and throughout).

Wang teaches the use of acrylates, vinyls, and urethane as the monomers to be polymerized (col. 10, Examples, and throughout), acting as the grafting material of Applicant. Wang teaches the use of a ketone compound (MEK) as the solvent (col. 12, line 25; Ex. 8). Wang teaches heparin, specifically, benzalkonium heparin or TDMAC, both taught in the instant specification as the types of heparin meeting the claims (col. 11, line 25), as the anti-thrombogenic agent.

End-immobilization occurs via the pendant amine group of the heparin compound.

Additionally, Wang teaches that the method of his invention is useful for coating medical devices which are inserted into blood vessels (col. 1, line 12). Such devices are inclusive of stents. It would have been obvious to one of ordinary skill in the art to use the method of Wang to coat stents, which are inserted into blood vessels, with the expectation of successful results since Wang teaches the use of his invention on such devices.

Wang teaches the use of a combination of materials to form the base coat layer, including polyurethane and several acrylates. It is Examiner's position that the specific choice of polyurethane acrylate for the coating would have been within the skill of an ordinary artisan given Wang's teachings of polyurethane and acrylates as the coating materials.

While Wang teaches the use of photoinitiators, above, and that the use of UV treatments to graft polymers is well-known in the art (col. 2) he teaches that there are some disadvantages of

using UV radiation when tubing is being coated. Thus, he does not exemplify any durations of UV irradiation. However, stents are not solid tubes and therefore, photo-induced grafting does not yield the disadvantages in stents as discussed by Wang in the coating of, for example, catheters. Therefore, it would have been obvious to one of ordinary skill in the art to select UV-irradiation as a means for grafting/polymerizing the monomers of Wang and to select an appropriate time to carry out such irradiation depending on the types of monomers used, the concentration of photoinitiator used, and the degree of polymerization/grafting desired. It is well settled that determination of optimum values of cause effective variables such as these process parameters is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

While Wang teaches immobilization of heparin to the chemically functional groups within the base coat layer, above, the reference fails to state that the heparin is applied in aqueous solution. However, Examiner notes that heparin is water-soluble and that water is a safe, pH-neutral solvent for use on medical devices that will be placed within the body, therefore, it is Examiner's position that the use of water as a medium for coating the medical device of Wang would have been obvious to one of ordinary skill in the art. The timeframes and temperatures used in this coating step would have been optimized by one of ordinary skill in the art for those reasons outlined above.

While Wang teaches compounds that would act as a binder in such a process, Wang fails to teach the specific binders of Applicant.

Fan teaches that it is known to attach lubricious acrylic-based polymers to stents using a binder polymer with aldehyde or isocyanate functional groups (col. 1, throughout).

Since Wang teaches grafting coatings onto medical devices and Fan teaches the use of the specific binder polymers of Applicant to do so, it would have been obvious to an ordinary artisan to use the aldehyde or isocyanate binders of Fan in the method of Wang with the expectation of successful results since Fan teaches that such binders are well-known in such coating applications. Aldehydes are inclusive of cinnamaldehyde.

Response to Arguments

The applicant has argued that Fan teaches the binder polymer to attach lubricious acrylic-based polymers to stents. The examiner would point to the explanation above that teaches that the binders of Fan can be used in the Wang method to both attach a coating to a medical device and bind a compound such as heparin.

17. Claims 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/38546.

'546 is applied here for the reasons given above.

'546 does not teach the time, temperature or pH of claims 14 and 18, but it would have been obvious to one of ordinary skill in the art to have optimized the application of the heparin solution thru no more than routine experimentation.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to /Erma Cameron/ whose telephone number is 571-272-1416. The examiner can normally be reached on 8:30-6:00, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Erma Cameron/
Primary Examiner
Art Unit 1762

May 22, 2007